Claims

Having thus described the invention, what is claimed as new and desired to be secured by Letters Patent is as follows:

1. A 3D angle measurement instrument for measuring angular displacement along any plane axis, comprising:

a casing;

a battery positioned in said casing;

a gyroscope positioned in said casing and electrically connected to said battery, said gyroscope capable of measuring acceleration/deceleration velocity and generating an output signal; and

a microprocessor positioned in said casing and electrically connected to said battery and said gyroscope for receiving said output signal, said microprocessor adapted to calculate an angular displacement value using said output signal and a predetermined time factor.

2. The measurement instrument as in claim 1 further comprising a reset button on said casing and electrically connected to said microprocessor for selectably resetting a reference point to zero, whereby a calculation using a subsequent output signal yields an angular displacement value offset from said reset reference point.

3. The measurement instrument as in claim 1 wherein:

said casing includes a generally square-shaped configuration having bottom and top walls with side walls extending therebetween;

means for displaying said angular displacement value in degrees offset from a reference point, said means for displaying including an electronic display mounted on said top wall and electrically connected to said microprocessor for displaying said angular displacement value.

4. The measurement instrument as in claim 1 wherein said gyroscope is a microelectromachined (MEM) gyroscope in which said output signal is a voltage proportional to a corresponding angular inertia velocity.

5. The measurement instrument as in claim 1 wherein said gyroscope is a fiber-optic gyroscope in which counter-propagating light beams traveling through an optical coil yield a time difference proportional to a degree of angular rotation of said optical coil, said output signal including data indicative of said time difference.

6. The measurement instrument as in claim 1 further comprising means for filtering said output signal, whereby to remove undesired electronic noise and unintended angular movements caused by human vibrations.

7. The measurement instrument as in claim 1 further comprising:

a memory electrically connected to said microprocessor for selectively storing at least one angular displacement value calculated by said microprocessor;

a sound generator; and

wherein said microprocessor is adapted to energize said sound generator when a subsequently calculated angular displacement value equals a respective stored angular displacement value.

8. The measurement instrument as in claim 1 further comprising a laser module positioned in said casing and electrically connected to said battery, said laser module adapted to selectably emit a laser beam through an aperture defined by one side wall of said casing, said laser beam being emitted along an imaginary axis corresponding to an angular orientation of said casing.

9. The measurement instrument as in claim 1 further comprising means for visually indicating an inclination of said casing with respect to the Earth's surface.

10. A 3D angle measurement instrument for measuring angular displacement along any plane axis, comprising:

a casing having bottom and top walls with side walls extending therebetween, said casing defining an interior space;

a battery positioned in said interior space of said casing;

a gyroscope positioned in said interior space and electrically connected to said battery, said gyroscope capable of measuring acceleration/deceleration velocity and generating a corresponding analog output signal, said output signal being indicative of a voltage proportional to a corresponding angular velocity;

a microprocessor positioned in said casing and electrically connected to said battery and said gyroscope for receiving said output signal, said microprocessor adapted to calculate an angular displacement value using said output signal received over a predetermined period of time;

a button mounted on said casing and electrically connected to said microprocessor for selectably setting a reference point; and

means in said microprocessor for converting said angular displacement value to a number of degrees offset from said reference point.

11. The measurement instrument as in claim 10 further comprising an electronic display electrically connected to said microprocessor for displaying said converted angular displacement value.

12. The measurement instrument as in claim 10 further comprising means for filtering said output signal, whereby to remove undesired electronic noise and unintended angular movements caused by human vibrations.

13. The measurement instrument as in claim 10 further comprising a sound generator;

wherein said microprocessor includes a memory for selectively storing at least one angular displacement value calculated by said microprocessor; and

wherein said microprocessor is adapted to energize said sound generator when a subsequently calculated angular displacement value equals a respective stored angular displacement value.

14. The measurement instrument as in claim 13 further comprising a laser module positioned in said casing and electrically connected to said battery, said laser module adapted to selectably emit a laser beam through an aperture defined by one side wall of said casing.

15. The measurement instrument as in claim 13 further comprising means for visually indicating an inclination of said casing with respect to the Earth's surface.

16. The measurement instrument as in claim 10 further comprising a laser module positioned in said casing and electrically connected to said battery, said laser module adapted to selectably emit a laser beam through an aperture defined by one side wall of said casing, said laser beam being emitted along an imaginary axis corresponding to an angular orientation of said casing.

17. The measurement instrument as in claim 10 further comprising means for visually indicating an inclination of said casing with respect to the Earth's surface.

18. A method for measuring angular displacement along any plane axis, comprising:

providing a handheld casing;

measuring acceleration/deceleration velocities resulting from angular movement of said casing;

calculating an angular displacement value by integrating said measured velocities in relation to a time factor associated with said measured velocities;

converting said angular displacement value into an angular degree measurement offset from a user-selected angular reference plane; and

displaying said angular degree measurement.

19. The method as in claim 18 further comprising:

selectively storing said angular displacement value; and

emitting an audible sound when a subsequently calculated angular displacement value is equal to a stored angular displacement value.

20. The method as in claim 18 further comprising:

providing at least one bubble level on said casing for visually indicating an inclination of said casing relative to the Earth's surface; and

providing a laser module in said casing for selectively emitting a laser beam along an imaginary axis corresponding to an angle of inclination of said casing.